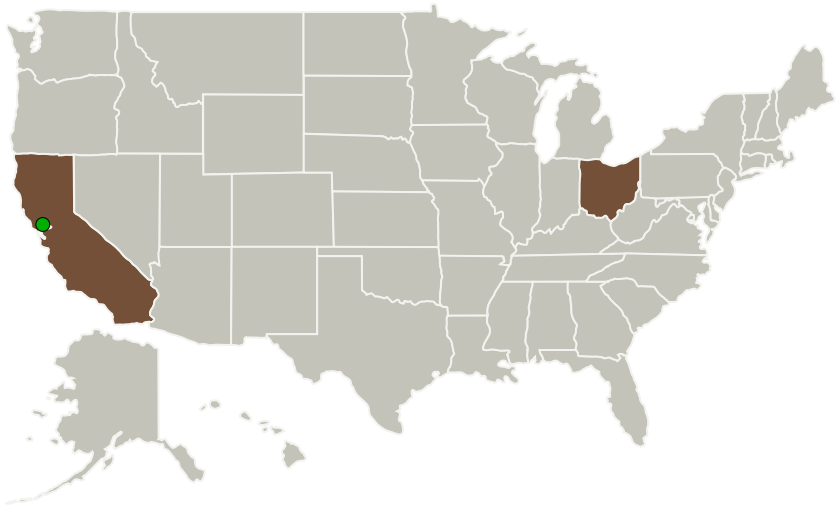
Tunable Interior Rotorcraft Noise Control, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

CRG has recently developed a new class of shape memory polymers (SMP) that are electrically activated, as opposed to the more mature thermally activated SMPs. Electrically activated shape memory polymers (EASMP) open a new design space of unexplored functionality beyond what has been considered for thermally activated materials. This project will combine the advantages of EASMP with the design of state-of-the-art gearbox isolators and interior panels to provide the ability to tune these components for specific operational frequencies. With the use of EASMP integrated components, by semi-actively altering the interior panels or gearbox isolators' frequency response, it will be possible to better target and control particularly irritating tones related to the aircraft's flight mode. CRG proposes to advance EASMP maturity which is applicable across many other application areas and has the benefit of alternative stimuli boasting ultra-low power requirements and more potential for faster switching times. This material will be refined and further developed to meet the operational performance requirements for the rotorcraft isolator application.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Ohio

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140673)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Cornerstone Research Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jason Hermiller

Co-Investigator:

Jason Hermiller

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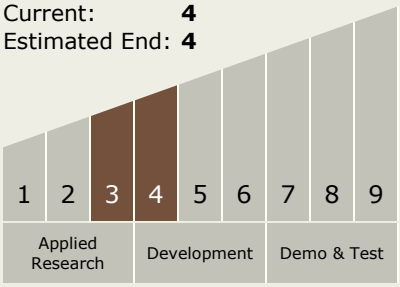
Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.8 Smart Materials

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System